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KEYS TO THE FERNS AND FERN ALLIES OF JEFFERSON COUNTY, KENTUCKY

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FOREWORD

The following keys to the pteridophytes of Jefferson County, Kentucky, are presented as an aid to those who wish to know more about these plants. By accurately observing the parts of a plant and by skillful use of the keys, the name of the plant can be found easily.

The keys are arranged in pairs of leads. In keys to the families the pairs of leads are A, A; B, B; C, C; etc. To find the family to which the plant belongs, read both leads in each pair, as A, A. Select the one that fits the plant, and if it does not give the family name, proceed to the next pair of leads under it, as B, B. Follow this selective procedure until the family name is reached.

Keys to the genera, species, and varieties are not *lettered* but each succeeding pair of leads is *indented* two spaces to the right. Follow the same procedure, using the indentures as letters were used in locating the family name.

Along with the full scientific name of each species or variety are synonyms (which are in parenthesis), common name, and as far as is known, the abundance and habitat.

Many persons and sources of reference have contributed to the making of these keys. I wish to thank all those who have collected, identified, or contributed distribution records on plants of this area. Of the source material consulted, special credit is given for materials used to Deam's *Flora of Indiana*, McCoy's *Ferns and Fern Allies of Kentucky*, and McFarland's *Catalogue of the Vascular Plants of Kentucky*.

Illustrations and a glossary are included to aid in the understanding of the technical terms.

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PTERIDOPHYTA

Plants without true flowers or seeds (reproduction by spores).

- A. Stems strongly grooved and jointed; nodes covered by toothed sheaths; sporangia in a terminal cone**EQUISETACEAE**, p. 35.
- A. Stems not strongly grooved and jointed; nodes without toothed sheaths.
 - B. Leaves narrow, scale- or awl-like, closely imbricated; sporangia axillary.
 - C. Stems short; leaves long, awl-shaped in corm-like trunk; sporangia in cavity on inner side of leaf-base (aquatic or mud plants)**ISOETACEAE**, p. 35.
 - C. Stems elongated, erect or creeping; leaves short, crowded or imbricated; sporangia in axils of scale-like leaves.
 - D. Plants moss-like; spores of two sizes**SELAGINELLACEAE**, p. 35.
 - D. Plants not moss-like; spores all the same size**LYCOPODIACEAE**, p. 35.
 - B. Leaves (fronds) broadly entire or dissected, not closely imbricated; sporangia borne on back of leaf, in spike or panicle (fern-like).
 - E. Sporangia large, borne on a simple spike or panicle at the end of a long fertile stalk; annulus lacking**OPHIOGLOSSACEAE**, p. 36.
 - E. Sporangia small, nearly covering the modified contracted leaflets or clustered on the lower surface of ordinary vegetative leaves or leaf segments.
 - F. Sporangia nearly covering the modified contracted leaflets which replace the vegetative ones; sporangia short-stalked**OSMUNDACEAE**, p. 37.
 - F. Sporangia borne on the lower surface of ordinary vegetative leaves or leaf segments; sporangia long-stalked**POLYPODIACEAE**, p. 37.

EQUISETACEAE Michx. HORSETAIL FAMILY**EQUISETUM** [Tourn.] L.

Stems of two kinds; fruiting stems branchless, without chlorophyll, vegetative ones green with whorled branches; stomata scattered; cones not tipped with a rigid point 1. **E. arvense**.

Stems of one kind, evergreen; stomata in regular rows; cones tipped with a rigid point.

Stems rough, tuberculate; sheaths cylindrical, short, appressed.....2. **E. prealtum**.

Stems nearly smooth, not tuberculate; sheaths elongated, funnel-shaped3. **E. laevigatum**.

1. *Equisetum arvense* L. FIELD HORSETAIL. Infrequent, in moist places.
2. *Equisetum prealtum* Raf. (*Equisetum hyemale* var. *affine* (Engelm.) Eaton.) TALL SCOURING-RUSH. Infrequent, near streams.
3. *Equisetum laevigatum* A. Br. SMOOTH SCOURING - RUSH. Rare.

ISOETACEAE Underw. QUILLWORT FAMILY**ISOETES** L.

1. *Isoetes Engelmanni* A. Br. ENGELMANN QUILLWORT. Rare.

SELAGINELLACEAE Underw.**SELAGINELLA** Beauv.

1. *Selaginella apoda* (L.) Fern. (*Selaginella apus* Spring.) BASKET SELAGINELLA. Rare.

LYCOPODIACEAE Michx. CLUBMOSS FAMILY**LYCOPODIUM** L.

Sporangia borne in an apical, cone-like spike 1. **L. flabelliforme**.
Sporangia borne in the axils of vegetative leaves.

Stems decumbent to erect; leaves 8-12 mm. long, with alternate

zones of long and short ones; leaves widest above the middle2. **L. lucidulum.**

Stems usually erect; leaves uniform, 4-8 mm. long, widest below the middle3. **L. Selago** var. **patens.**

1. *Lycopodium flabelliforme* (Fern.) Blanchard. (*Lycopodium com-panatum* var. *flabelliforme* Fern.) GROUND PINE. Rare.
2. *Lycopodium lucidulum* Michx. SHINING CLUBMOSS. Rare.
3. *Lycopodium Selago*. L. var. *patens* (Beauv.) Desv. (*Lycopodium porophilum* Lloyd and Underw.) FIR CLUBMOSS. Rare.

OPHIOGLOSSACEAE Presl ADDER'S TONGUE FAMILY

Sterile leaf entire, veins reticulate; sporangia in two rows on a simple slender spike1. **Ophioglossum.**

Sterile leaves 1-several times divided, veins free; sporangia in a spike or panicle2. **Botrychium.**

1. OPHIOGLOSSUM [Tourn.] L.

1. *Ophioglossum vulgatum* L. COMMON ADDER'S TONGUE.
Infrequent, in shady, moist places.

2. BOTRYCHIUM Sw.

Leaves sessile and arising near the middle of the stem; leaf thin, several times pinnate1. **B. virginianum.**

Leaves on long stipes arising near the base; leaf firm, bipinnate.

Leaflets deeply cut into linear segments, notched at the apex2. **B. dissectum.**

Leaflets not deeply dissected but unevenly cut.....3. **B. dissectum** var. **obliquum.**

1. *Botrychium virginianum* (L.) Sw. RATTLESNAKE FERN.
Frequent in moist, rich woods.
2. *Botrychium dissectum* Spreng. (*Botrychium obliquum* var. *dissectum* (Spreng.) Clute.) CUTLEAF GRAPEFERN. Rare.
3. *Botrychium dissectum* var. *obliquum* (Muhl.) Clute. (*Botrychium obliquum* Muhl.) OBLIQUE GRAPEFERN. Infrequent, in various habitats.

OSMUNDACEAE R. Br. ROYAL FERN FAMILY

OSMUNDA [Tourn.] L.

Leaves coarsely bipinnate; tip leaflets of some of the leaves fertile1. **Osmunda regalis** var. **spectabilis**.

Leaves once pinnate, leaflets closely pinnatifid.

Leaves dimorphic; leaflets of sterile leaves with tufts of wool at the base2. **Osmunda cinnamomea**.

Leaves not dimorphic; fertile leaflets near middle of leaf; lacking tufts of wool at base of the leaflets
.....3. **Osmunda Claytoniana**.

- 1. *Osmunda regalis* L. var. *spectabilis* (Willd.) Gray. (*Osmunda regalis* of American authors, not L.) ROYAL FERN. Rare.
- 2. *Osmunda cinnamomea* L. CINNAMON FERN. Rare.
- 3. *Osmunda Claytoniana* L. INTERRUPTED FERN. Rare.

POLYPODIACEAE R. Br. FERN FAMILY

Leaves dimorphic; sterile blades deeply pinnatifid, leaflets with wavy margins; fertile ones rigid, with greatly contracted divisions, brown when fully matured
.....1. **Onoclea**, p. 39.

Leaves not conspicuously dimorphic; sterile and fertile blades flat and green.

Sori on or near the margin of the leaflets or segments.

Sporangia borne in small cup-shaped indusia near the notches of the segments; rachis glandular, hairy; frond fragrant
.....2. **Dennstaedtia**, p. 39.

Sporangia not in cup-shaped indusia.

Sporangia borne in a continuous line near the margin of the segments; leaf segments not fan-shaped.

Blades ternate; leaflets usually pinnatifid; diameter of stipes more than 2 mm.; stipe and rachis green
.....3. **Pteridium**, p. 39.

Blades not ternate; leaflets not pinnatifid, smooth; diameter of stipes less than 2 mm.; stipe and rachis dark brown to purplish4. **Pellaea**, p. 39.

Sporangia separate, not borne in a continuous line; leaf segments fan-shaped, tapering to the base5. **Adiantum**, p. 39.

Sori not marginal but dorsal upon the veins (except *Dryopteris marginalis* in which they are near the margins of the leaflets.)

Sori (and indusia when present) nearly circular.

Leaflets auriculate at the base, margins of the leaflets with appressed bristle teeth6. **Polystichum**, p. 39.

Leaflets not auriculate at the base.

Indusia attached all around; stipe and lower surface of the leaflets more or less glandular pubescent7. **Woodsia**, p. 40.

Indusia when present attached by the center or to one side; stipe and lower surface of the leaflets usually not glandular pubescent.

Leaves deeply pinnatifid, blades much longer than wide, leathery; indusia absent8. **Polypodium**, p. 40.

Leaves not deeply pinnatifid, blades more or less triangular; indusia may or may not be present.

Indusia absent; or if present, attached in the center and with a groove on one side9. **Dryopteris**, p. 40.

Indusia present and attached on the side nearest the mid-vein, opening on opposite side10. **Cystopteris**, p. 41.

Sori oblong to linear, occasionally curved.

Blades entire, lanceolate, cordate at base; frequently rooting at the tip11. **Camptosorus**, p. 41.

Blades 1-several times divided.

Leaves small, 8-35 cm. long, evergreen; sori straight or slightly curved12. **Asplenium**, p. 41.

Leaves larger, 35-100 cm. long, not evergreen; sori straight or conspicuously curved over the ends of the veins
13. *Athyrium*, p. 42.

1. ONOCLEA L.

1. *Onoclea sensibilis* L. SENSITIVE FERN. Infrequent, in low wet places.

2. DENNSTAEDTIA Bernh.

1. *Dennstaedtia punctilobula* (Michx.) Moore. (*Dicksonia punctilobula* (Michx.) Gray.) HAY-SCENTED FERN. Infrequent, in various habitats.

3. PTERIDIUM Scop.

1. *Pteridium latiusculum* (Desv.) Hieronymus. (*Pteris aquilina* of Gray's Man., 7 ed., not L. and *Pteridium aquilinum* of Britton and Brown's Illus. Flora, 2 ed., not Kuhn.) BRACKEN FERN. Rare.

4. PELLAEA Link

Stipe and rachis densely pubescent with rusty hairs
1. *P. atropurpurea*.

Stipe and rachis glabrous or with a few scattered hairs
2. *P. glabella*.

1. *Pellaea atropurpurea* (L.) Link. PURPLE CLIFFBRAKE. Infrequent, on rock ledges near streams.
2. *Pellaea glabella* Mett. SMOOTH PURPLE CLIFFBRAKE. Rare.

5. ADIANTUM [Tourn.] L.

1. *Adiantum pedatum* L. MAIDENHAIR FERN. Frequent in moist, fertile habitats.

6. POLYSTICHUM Roth

1. *Polystichum acrostichoides* (Michx.) Schott. CHRISTMAS FERN. Frequent on rich shady slopes.

7. **WOODSIA** R. Br.

1. *Woodsia obtusa* (Spreng.) Torr. COMMON WOODSIA. Infrequent, on slopes near streams.

8. **POLYPODIUM** [Tourn.] L.

Blades green, glabrous.1. **P. virginianum.**

Blades grayish, lower surface densely covered with scales
2. **P. polypodioides** var. **Michauxianum.**

1. *Polypodium virginianum* L. (*Polypodium vulgare* of American authors, not L.) COMMON POLYPODY. Rare.
2. *Polypodium polypodioides* (L.) Watt. var. *Michauxianum* Weath (*Polypodium polypodioides* (L.) RESURRECTION FERN. Rare.

9. **DRYOPTERIS** Adans.

Blades usually wider than long, triangular; indusia obscure or lacking1. **D. hexagonoptera.**

Blades longer than wide; indusia present.

Leaves firm and thick, veins more than once divided; rhizomes short, nearly erect.

Sori near margin of leaflets2. **D. marginalis.**

Sori not marginal.

Blades once or twice pinnate; leaflets widest above the base3. **D. Goldiana.**

Blades usually tripinnate or tripinnatifid, segments with spinulose teeth; leaflets widest at the base.

Indusia glabrous4. **D. spinulosa.**

Indusia glandular-pubescent5. **D. intermedia.**

Leaves thin, veins usually once divided; rhizomes slender and creeping.

Lower leaflets about equalling the others in length, more than 25 mm. long6. **D. Thelypteris** var. **pubescens.**

Lower leaflets gradually decreasing in size toward the base, lowest ones less than 15 mm. long

.....7. **D. noveboracensis.**

1. *Dryopteris hexagonoptera* (Michx.) C. Chr. (*Phegopteris hexagonoptera* (Michx.) Fee.). WINGED WOODFERN. Frequent in various habitats.
2. *Dryopteris marginalis* (L.) Gray. (*Aspidium marginale* (L.) Sw.) LEATHER WOODFERN. Infrequent, on wooded slopes.
3. *Dryopteris Goldiana* (Hook.) Gray. (*Aspidium Goldianum* Hook.) GOLDIE FERN. Rare.

4. *Dryopteris spinulosa* (Muell.) Watt. (*Aspidium spinulosum* (Muell.) Sw.) TOOTHED WOODFERN. Rare.
5. *Dryopteris intermedia* (Muhl.) Gray. (*Aspidium spinulosum* var. *intermedium* (Muhl.) Eaton and *Dryopteris spinulosa* var. *intermedia* (Muhl.) Underw.) COMMON WOODFERN. Rare.
6. *Dryopteris Thelypteris* (L.) Gray var. *pubescens* (Lawson) Nakai. (*Aspidium Thelypteris* of Gray's Man., 7 ed., not Sw.; *Dryopteris Thelypteris* of Britton and Brown's Illus. Flora, 2 ed., not Gray; and *Thelypteris palustris* of authors, not Schott.) MARSHFERN. Rare.
7. *Dryopteris noveboracensis* (L.) Gray. (*Aspidium noveboracense* (L.) Sw.) NEW YORK FERN. Rare.

10. CYSTOPTERIS Bernh.

Blades lanceolate, long tapering, broadest at the base; rachis wingless, often producing bulblets beneath upper part

.....1. **C. bulbifera.**

Blades oblong-lanceolate, scarcely broader at the base, rachis slightly marginal or obscurely winged, non-bulblet bearing

.....2. **C. fragilis.**

1. *Cystopteris bulbifera* (L.) Bernh. (*Filix bulbifera* (L.) Underw.) BERRY BLADDER FERN. Infrequent, in moist places.
2. *Cystopteris fragilis* (L.) Bernh. (*Filix fragilis* (L.) Underw.) BRITTLE FERN. Infrequent, in fertile, shady habitats.

11. CAMPTOSORUS Link

1. *Camptosorus rhizophyllus* (L.) Link. WALKING FERN. Infrequent, on moist rocks.

12. ASPLENIUM L.

Blades long attenuate at apex, pinnatifid, or pinnate only near the base

.....1. **A. pinnatifidum.**

Blades not long attenuate at apex, pinnate throughout.

Blades 2-3 pinnate, leaflets long tapering toward the base; stipe green

.....2. **A. cryptolepis.**

Blades usually once pinnate, leaflets not long tapering toward the base; stipes reddish-brown.

Leaflets oblong-linear, sessile, 8-30 mm. long, more or less auriculate at the base

.....3. **A. platyneuron.**

Leaflets oblong to oval, sessile, 3-7 mm. long, not auriculate at the base

.....4. **A. Trichomanes.**

1. *Asplenium pinnatifidum* Nutt. PINNATIFID SPLEENWORT. Rare.
2. *Asplenium cryptolepis* Fern. (*Asplenium Ruta-muraria* of Gray's Man., 7 ed. and Britton and Brown's Illus. Flora, 2 ed., not L.) AMERICAN WALL-RUE SPLEENWORT. Rare.
3. *Asplenium platyneuron* (L.) Oakes. EBONY SPLEENWORT. Infrequent, in various habitats.
4. *Asplenium Trichomanes* L. MAIDENHAIR SPLEENWORT. Rare.

13. **ATHYRIUM** Roth

Leaves bipinnate; sori generally curved.

Stipe about half as long as the blade; rhizomes concealed by the thick bases of old leaves; indusia not glandular.

Sori joined at maturity, usually covering the under side of the fertile contracted leaflets1. **A. angustum** var. **elatus**.

Sori usually separate at maturity; fertile leaflets not contracted2. **A. angustum** var. **rubellum**.

Stipe about as long as the blade, rhizomes not densely covered with persistent leaf bases; indusia with glandular hairs.3. **A. asplenioides**.

Leaves once pinnate; sori straight or nearly so.

Leaflets short-stalked, entire4. **A. pycnocarpon**.

Leaflets sessile, deeply pinnatifid5. **A. thelypteroides**.

1. *Athyrium angustum* var. *elatus* (Link) Butters. LADY FERN. Rare.
2. *Athyrium angustum* var. *rubellum* (Gilbert) Butters. RED LADY FERN. Rare.
3. *Athyrium asplenioides* (Michx.) Desv. SOUTHERN LADY FERN. Rare.
4. *Athyrium pycnocarpon* (Spreng.) Tidestr. (*Asplenium angustifolium* Michx. and *Asplenium pycnocarpon* Spreng.) NARROW-LEAF SPLEENWORT. Infrequent, in fertile shady habitats.
5. *Athyrium thelypteroides* (Michx.) Desv. (*Asplenium acrostichoides* Sw. and *Athyrium acrostichoides* (Sw.) Diels.) SILVERY SPLEENWORT. Infrequent, in shady deep loam habitats.

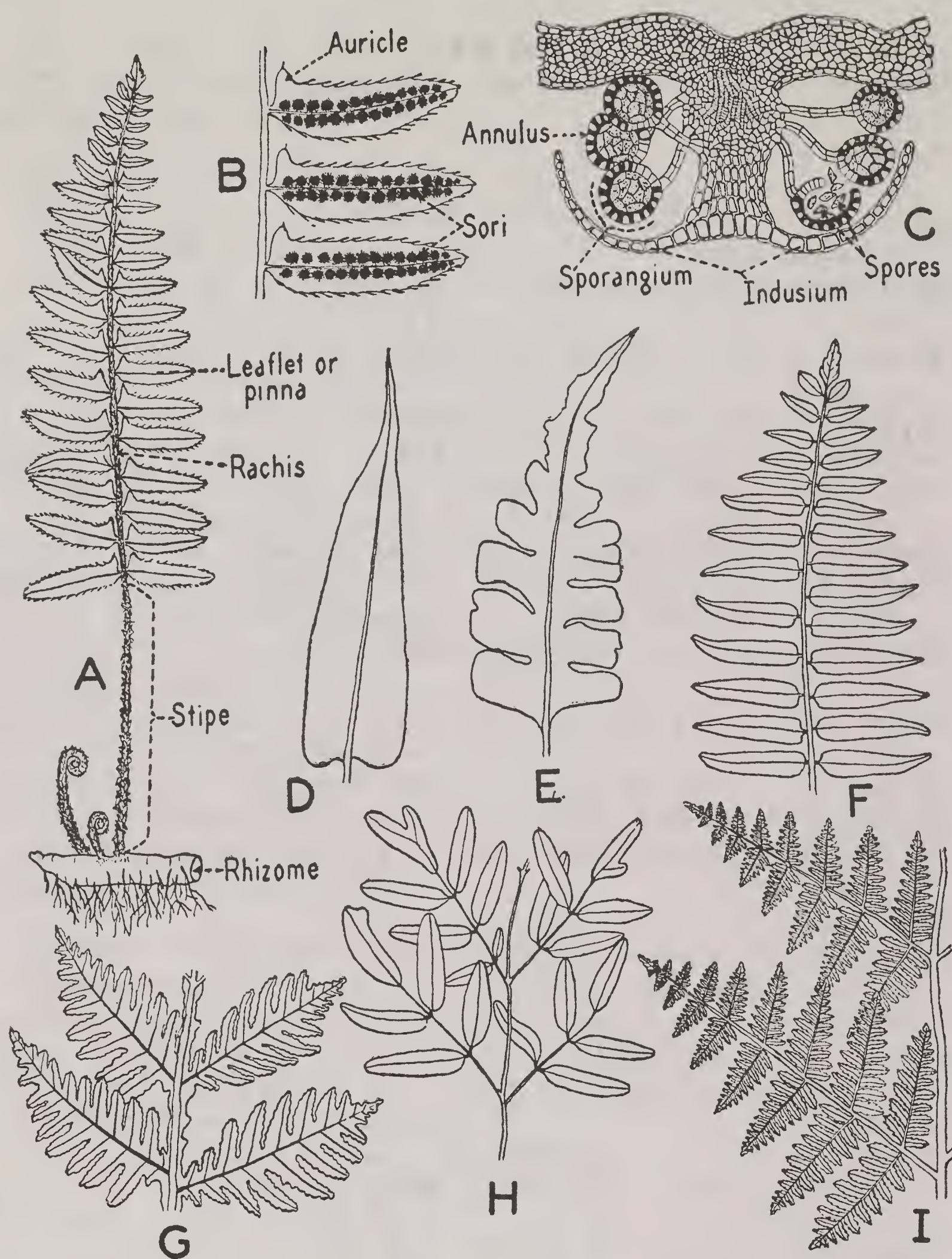


Figure 5

- A. Entire fern showing the frond (leaf), rhizome, roots, stipe, rachis and pinnae (leaflets).
- B. Three fertile pinnae, each with numerous sori and an auricle.
- C. Cross section of an enlarged sorus illustrating the indusium, sporangia, annulus and spores.
- D. Simple fern leaf with entire margins.
- E. Simple pinnatifid leaf.
- F. A 1-pinnate leaf; leaflet margins entire.
- G. Part of a 1-pinnate leaf; leaflet pinnatifid.
- H. Part of a 2-pinnate leaf.
- I. Part of a 3-pinnate leaf.



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G L O S S A R Y

Axillary. In the angle between the leaf and the stem.

Annulus. An elastic ring on a sporangium, causing it to open.

Attenuate. Gradually narrowed to a slender apex.

Auriculate. With a basal ear-like lobe.

Blade. The flat expanded part of a leaf.

Bulblet. A small bulb-like organ.

Cordate. Heart-shaped.

Corm. The swollen fleshy base of a stem.

Decumbent. Having the stem or branches on an incline with their growing ends erect.

Dimorphic. Separate fertile and sterile leaves.

Entire. Without divisions or teeth.

Frond. The leaf of a fern.

Glabrous. Devoid of hairs.

Habitat. The plant's natural place of growth.

Imbricate. Overlapping.

Indusium (pl. indusia). The membrane covering a sorus in ferns.

Lanceolate. Lance-shaped. Several times longer than broad, widest about a third above the base.

Panicle. A cluster of sporangia with a main axis and subdivided branches.

Pinna (pl. pinnae). One of the primary divisions of a leaf.

Pinnate. Leaf divided into leaflets or segments along a common axis.

Pinnatifid. Pinnately divided half-way or more toward the mid-vein.

Pubescent. Covered with hairs.

Rachis. The axis of a leaf-blade, continuing the stipe.

Reticulate. In the form of network; net-veined.

Rhizome. An underground stem, usually rooting at the nodes.

Sessile. Without a stalk.

Sheath. A tubular envelope, the lower part of a leaf that encloses the stem.

Sorus (pl. sori). A heap or cluster, applied to the fruit dots (sporangia) of ferns.

Spike. A group of fertile leaflets or sporangia, sessile or nearly so upon an elongated common axis.

Spinulose. With small sharp processes or spines.

Sporangium (pl. sporangia). A body in which spores are produced.

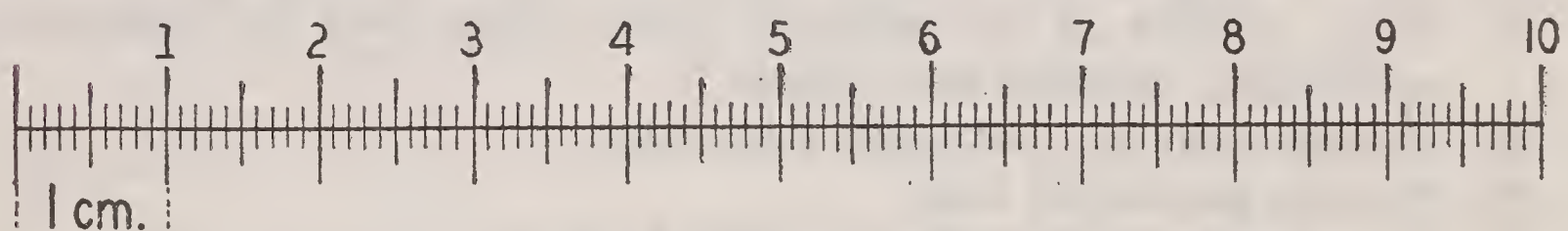
Spore. The simple reproductive body in the pteridophytes which roughly corresponds to a seed in the spermatophytes but possesses no embryo.

Stipe. The stalk supporting the blade of a fern leaf.

Stoma (pl. stomata). The transpiring orifices in the epidermis of plants.

Ternate. Divided into three segments, or arranged in threes.

Tuberculate. Furnished with small projections.



10 mm. (millimeter) equals 1 cm. (centimeter)

10 cm. (centimeter) equals 1 dm. (decimeter)

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